COASTAL
ENGINEERING ASSOCIATES INC.

D.E.P.
JAN 29 2001
Southwest District Tampa

January 25, 2001

Mr. Don DePra
Environmental Specialist II
Submerged Lands & Environmental Resources Program
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619

RE: Permit No. 27-278138-3

Dear Mr. DePra:

Please find enclosed the year 2000 Seagrass Monitoring Report. In accordance with specific Condition #9 of the above referenced permit; the post dredging seagrass monitoring event was conducted, on November 13, 2000, by Biological Research Associates and Coastal Engineering Associates, Inc. The report successfully completes Hernando County's fourth year of monitoring and is submitted for your review and file. Please address any comments you may have to my attention.

Sincerely,

Coastal Engineering Associates, Inc.

Cliff Manuel, Jr., P.E.
President

Enclosures

cc: Charles Mixson, Director of Public Works w/encl.

cb/m:cliff-seagrass

Engineering • Planning • Environmental • Construction Management • Transportation

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Biological Research Associates
Founded 1974

HERNANDO COUNTY DEPARTMENT OF PUBLIC WORKS
BAYPORT CHANNEL
FOURTH SEA GRASS MONITORING REPORT
FDEP Permit No. 271422133

Prepared by:

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3910 US Highway 301 North, Suite 180
Tampa, FL 33619

Prepared for:

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INTRODUCTION / PROJECT HISTORY

On September 16, 1997, Coastal Engineering Associates, Inc. (Coastal) was contracted by the Hernando County Department of Public Works (HCDPW) to perform sea grass monitoring and to provide a monitoring report in accordance with provisions for Bayport Channel dredging contained in permits issued by the Florida Department of Environmental Protection (FDEP) (#271422133) and the U.S. Army Corps of Engineers (COE) (#90IPF-03355).

The project site is located in Sections 25 and 36, Township 22 South, Range 16 East, Hernando County, Florida, at the western terminus of CR 550 (Figure 1). The FDEP and COE permits are for a channel extension and maintenance dredging project. The permit conditions in the Sea Grass Monitoring Plan specified that permanent sampling stations be established at four groups of channel markers (5/6, 7/8, 9/10, and 11/12), where the extension has occurred within the Bayport Channel. Two additional transects were established to monitor an existing section of the channel where only maintenance dredging occurred. The general channel area map (Figure 2) locates the positions of the channel marker groups and established vegetative transects used to monitor the channel.

Pre-dredging baseline data on vegetative species and percent coverage for each station was collected by Berryman and Henigar on 15 March 1995. The channel extension was dredged and maintenance was completed in May 1996. The first post-dredging monitoring report was provided by Coastal in October 1997. Due to turbid conditions from the unusual El Niño weather event, the second post-dredging monitoring report could not be completed. The third post-dredging sea grass monitoring event was conducted at the Bayport Channel on 7 December 1999. The fourth post-dredging sea grass monitoring event, the data for which is included in this report, was conducted on 13 November 2000.

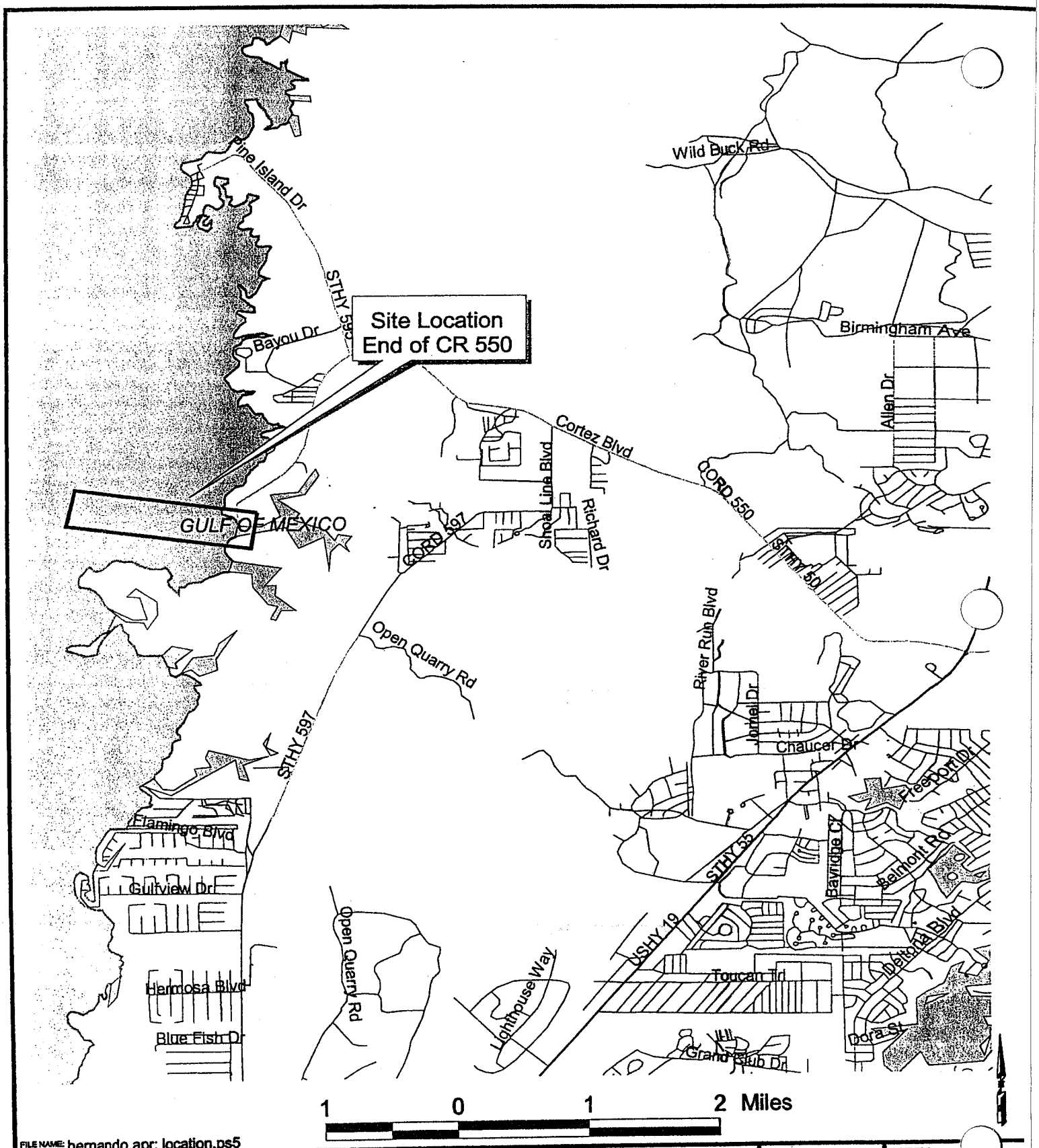
OBJECTIVE

According to permit provisions, the channel is to be monitored for five (5) years following dredging as outlined below; however, the HCDPW can discontinue monitoring sooner than five years after dredging if monitoring in the extension portions of the channel indicates that the percentage of sea grass coverage meets or exceeds the cover percentages prior to dredging. Standardized quantitative sampling provides objective, reproducible information about the plant community for use in assessing existing conditions, as well as the extent of recruitment during future monitoring events. Qualitative and quantitative monitoring activities summarized in this report were conducted by Biological Research Associates (BRA) on 13 November 2000.

METHODOLOGY

Field sampling methodologies generally followed the permit criteria recommended in the Sea Grass Monitoring Plan to document the natural recovery of sea grass vegetation within the dredged channel.

As outlined in the 1997 initial data study, six (6) transects were established with three (3) quadrats (each one square meter in area) per channel marker group with two (2) internal quadrats (Q1 and Q2) and one external quadrat (Q3). All Q1 quadrats are located 50 feet south of the northern channel markers and visually estimated to be between the channel markers. All Q2 quadrats are 50 feet north of the southern channel markers and visually estimated to be between the channel markers. The Q3 quadrats are positioned in an



FILE NAME: hernando.apr: location.ps5

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Suite 180
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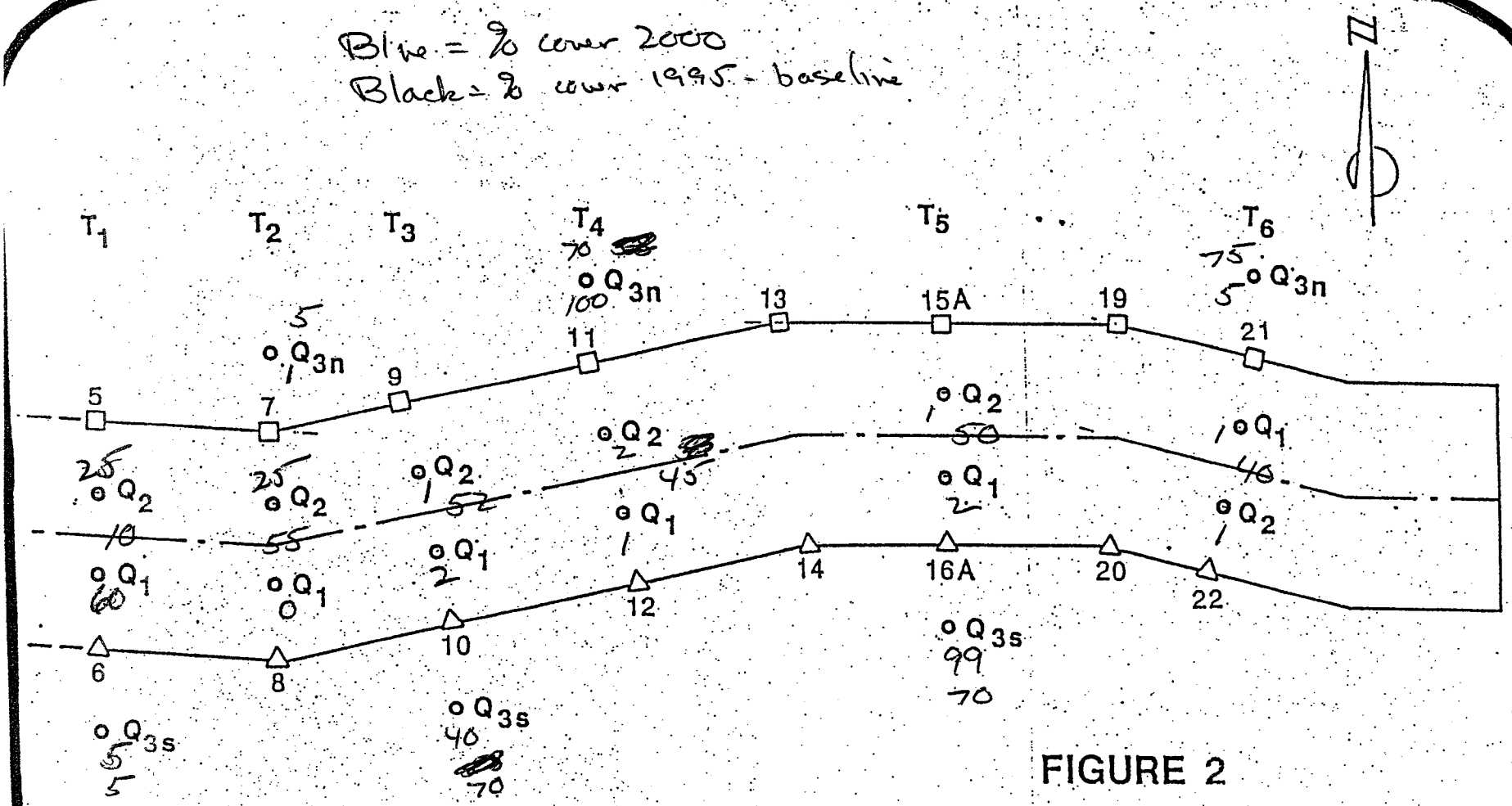
www.biologicalresearch.com

Figure 1. Bayport Seagrass Monitoring Location Map

PROJECT MANAGER: JJB	PROJECT #: 4637-[illegible]B62
DRAWN BY: PPS	DATE: 8 Jan 2001
CHECKED BY:	REVISION DATE

Blue = % cover 2000
Black = % cover 1995 - baseline



LEGEND

T_1 TRANSECT NO.

Q_1 QUADRAT NO. (photostation)

5 □ △ 6 CHANNEL MARKER & NO.

FIGURE 2

Bayport Channel Transects

October, 1997

PREPARED BY
COASTAL ENGINEERING ASSOCIATES, INC.
BROOKSVILLE, FLORIDA

CEA Project No. 97222-2

alternating pattern either 50 feet north or south of the six channel group markers outside the channel. T center points of all the quadrats are demarcated by sections of 3/4" PVC pipe embedded approximately 18" into the sea bottom with approximately 6" remaining above grade.

The composition and percent of cover of sea grass species present were quantitatively assessed by visually estimating the area covered by individual species and making counts of stem density in each quadrat. Estimates of other cover such as algae were also made but were not identified to species.

In order to estimate sea grass shoot densities stem counts were made in three (3) of 16 subunits of each individual quadrat. The internal transect subunit counts were averaged and then multiplied by 16 to estimate the density of sea grass shoots per meter squared in the dredged area as well as in the control quadrat located outside the dredged area.

Vegetative Ground/Cover

The area covered by sea grass and algal groundcover species, as well as the bare ground, was visually estimated and recorded at each of the 18 quadrats using the $1m^2$ sampling quadrat. The internal quadrats (Q1 and Q2) were averaged to determine the percent of vegetative cover for each transect as a community (Table 1).

Sea Grass Shoot Density

Vegetative shoot counts were conducted for each of the 18 quadrats using a modified version of the $1m^2$ sampling quadrat. The quadrat was divided into sixteen 25 centimeter by 25 centimeter subunits by string. Shoots of sea grass species were counted in three randomly chosen subunits. Sea grass shoot densit (number of shoots per square meter) was calculated by averaging the counts in the three subunits and multiplying that number by 16. The average stems per square meter (T Avg/m^2) is shown in Table 1.

Water Depth

Water depth and time of the sampling was measured and recorded at each quadrat. Depth data are presented in Table 1.

Photo Documentation

Each of the Eighteen $1m^2$ sampling quadrats were photographed. The photographs are included at the end of this report (Appendix A).

RESULTS

Sea grass species were identified as per the Key to Florida Sea grasses included as Appendix B at the end of this report. Sea grass species within the channel monitoring area included *Halodule wrightii* and *Thalassia testudinum*. *Thalassia* was more abundant than *Halodule*. A small patch of *Syringodium filiforme* was observed near channel marker 5 but none was observed in any of the sample plots. The data in Table 1 summarizes information on sea grass shoot densities and percent cover information for each repetition. Table 1 also provides average percent sea grass coverage of the channel for the internal quadrats in relation to the external quadrats.

Table 1.0 Sea Grass Monitoring Data Sheet. Data Collected 13 November 2000.

	REPETITIONS																	
	T1 CHAN 5/6			T2 CHAN 7/8			T3 CHAN 9/10			T4 CHAN 11/12			T5 CHAN 15a/16a			T6 CHAN 21/22		
	Q1	Q2	Q3s	Q1	Q2	Q3n	Q1	Q2	Q3s	Q1	Q2	Q3n	Q1	Q2	Q3s	Q1	Q2	Q3n
	percent cover			percent cover			percent cover			percent cover			percent cover			percent cover		
Thalassia testudinum	60 10	25 5	5			1	1		40		1	100	1		99			
Halodule wrightii					25	1	1	1		1	1		1	1		1	1	5
Average Total cover of sea grass in Q1 and Q2	42.5			12.5			1.5			1.5			1.5			1		
Alga	5	5	5	1	1			1	100	1	1				1			
Bare Ground .	35	70	90	99	74	98	98	98	0	98	97	0	98	99	0	99	99	95
Water Depth	5	5	5	4	4.5	4	4.5	4.5	3		4.5	2.5	4	4	2.5	4	4	1.5
Photo #	11	10	12	15	14	13	17	16	18	19	20	21	22	23	24	26	25	27
Photo Direction	W		W	N	S	W	N	S	N	N	W	N				N		N
Water Depth																		
Time	11:54	12:05	11:48	11:23	11:30	11:38	11:08	11:13	10:59	10:48	10:40	10:28	10:16	10:13	9:59	9:50	9:37	9:27
Tide Direction	In	In	In	In	In	In	In	In	In	In	In	In	Slack	Slack	Out	Out	Out	Out

SHOOT DENSITY	T1 CHAN 5/6				T2 CHAN 7/8				T3 CHAN 9/10				T4 CHAN 11/12				T5 CHAN 15a/16a				T6 CHAN 21/22			
	S4	S6	S13	Avg	S4	S6	S13	Avg	S4	S6	S13	Avg	S4	S6	S13	Avg	S4	S6	S13	Avg	S4	S6	S13	Avg
Q1	50	49	31	43	0	0	0	0	14	2	4	7	4	13	19	12	14	6	0	7	12	13	20	15
total/m²	693				0				107				192				107				240			
Q2	27	39	29	32	25	62	76	54	8	2	14	8	20	17	3	13	0	0	0	0	0	0	0	0
total/m²	507				869				128				213				0				0			
Q3	8	0	10	6	0	4	0	1	12	5	18	12	49	38	38	42	30	27	28	28	13	16	47	25
total/m²	96				21				187				667				453				405			
Q1 & Q2 T Avg/m²	600				435				117				203				53				120			

Vegetative Groundcover

Sea grass percent cover for the internal quads ranged from approximately 1 percent to 60 percent and algal species area coverage ranged from zero percent to 5 percent. The average percent cover of all internal quadrats (Q1s and Q2s) was 10 percent. The average of all external quadrats was 42 percent. Although the average percent cover of sea grasses of external sampling areas was higher, it is worth noting that for transects 1 and 2 average percent cover of sea grasses was higher in the dredged area.

Sea Grass Shoot Density

Internal transect shoot densities ranged from 56 to 528 shoots per $1m^2$, while external transect averages ranged from 16 to 672 shoots/m^2. Individual transect results are listed in Table 1 as well as on each photo-sheet.

Appendix A. Photographs.

Transect No.:	1
Quadrat:	1
Channel Markers:	5 and 6

Water Depth (Feet):	5
Photo Direction:	W

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	60
Alga	5
Bare ground	
Total Percent Cover (Vegetation)	60

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	50	49	31	43
Total Stems/square meter:	693			

* Each quadrat was divided into 16 subquadrats

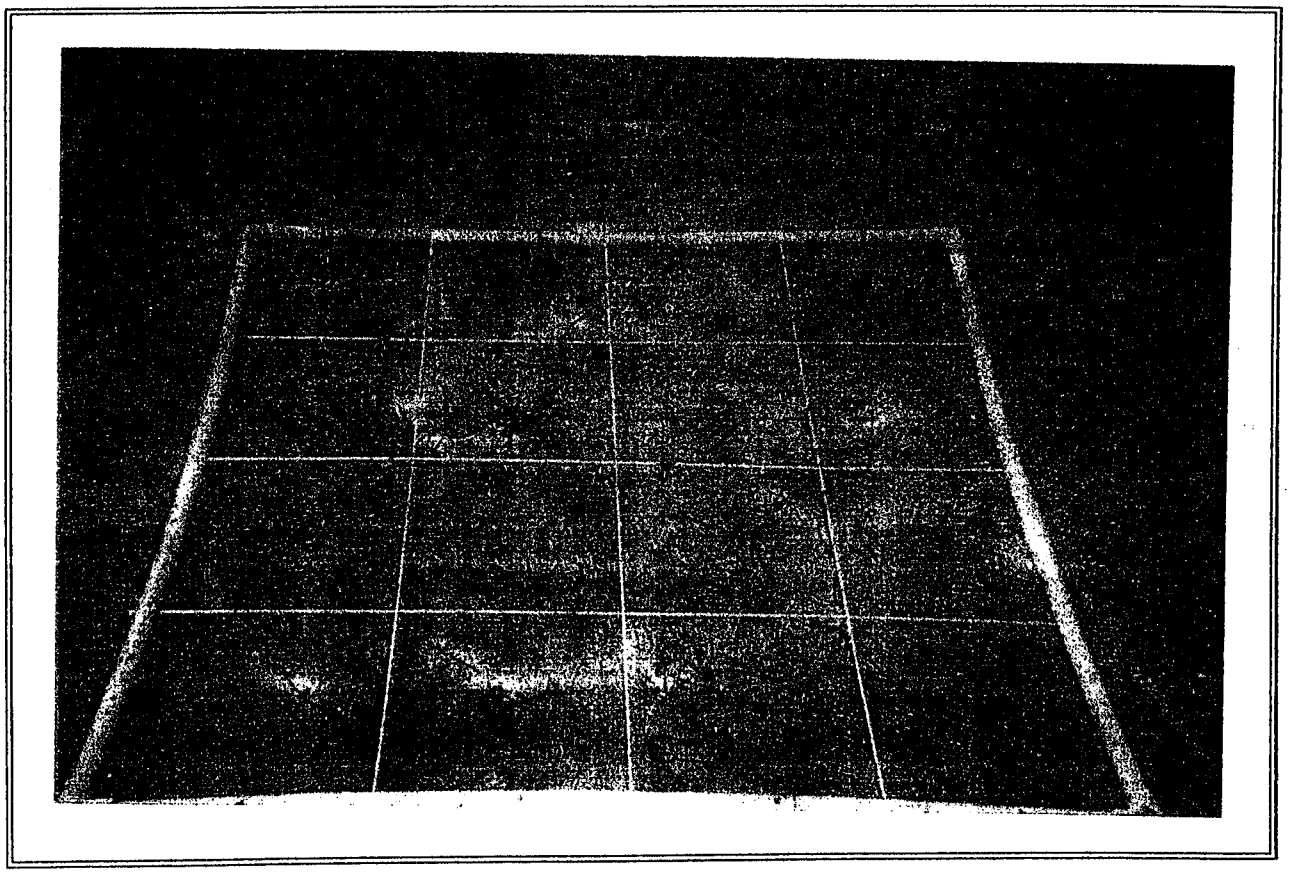
Transect No.:	1
Quadrat:	2
Channel Markers:	5 and 6

Water Depth (Feet):	5
Photo Direction:	W

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	25
Alga	5
Bare ground	
Total Percent Cover (Vegetation)	25

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	27	39	29	32
Total Stems/square meter:	507			

* Each quadrat was divided into 16 subquadrats



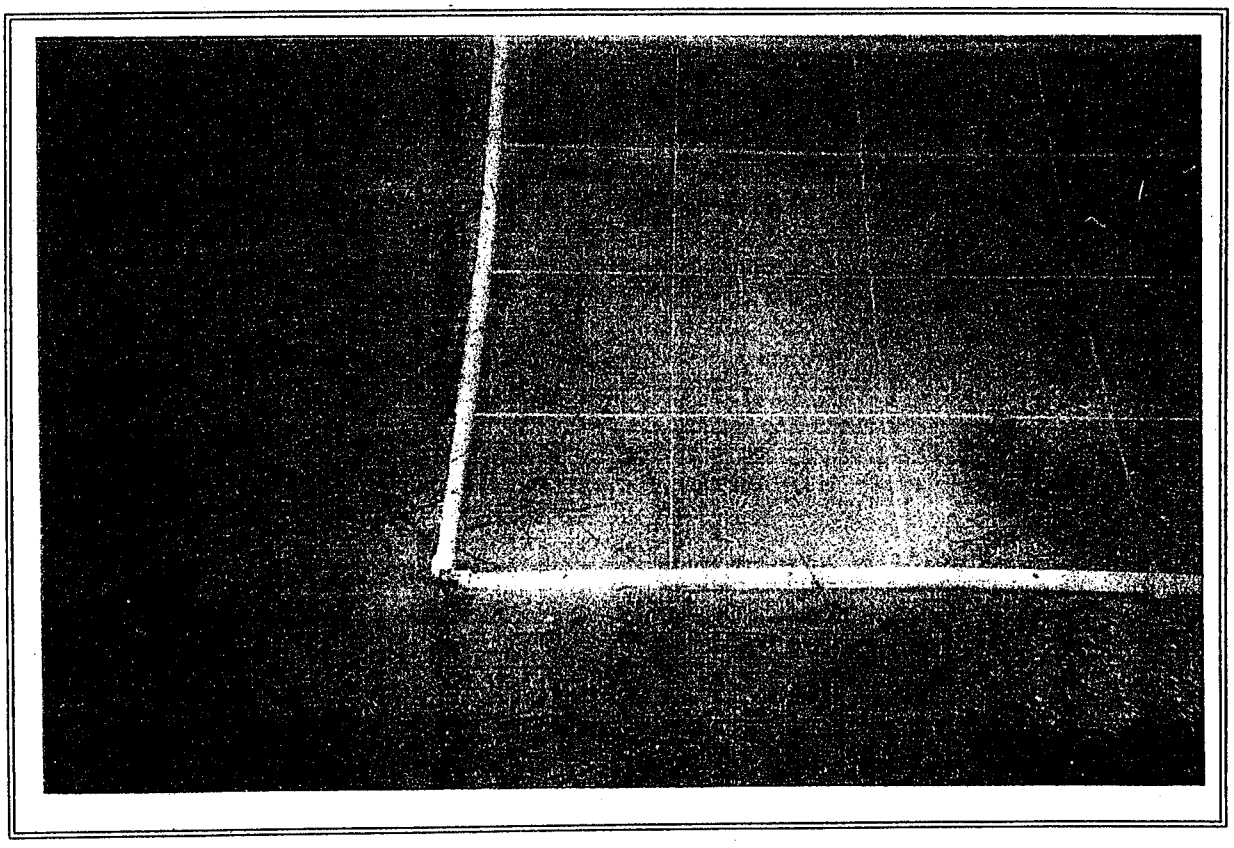
Transect No.:	1
Quadrat:	3
Channel Markers:	5 and 6

Water Depth (Feet):	5
Photo Direction:	W

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	5
Alga	5
Bare ground	
Total Percent Cover (Vegetation)	5

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	8	0	10	6
Total Stems/square meter:	96			

* Each quadrat was divided into 16 subquadrats



Transect No.:	2
Quadrat:	1
Channel Markers:	7 and 8

Water Depth (Feet):	4
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	0

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	0	0	0	0
Total Stems/square meter:		0		

* Each quadrat was divided into 16 subquadrats

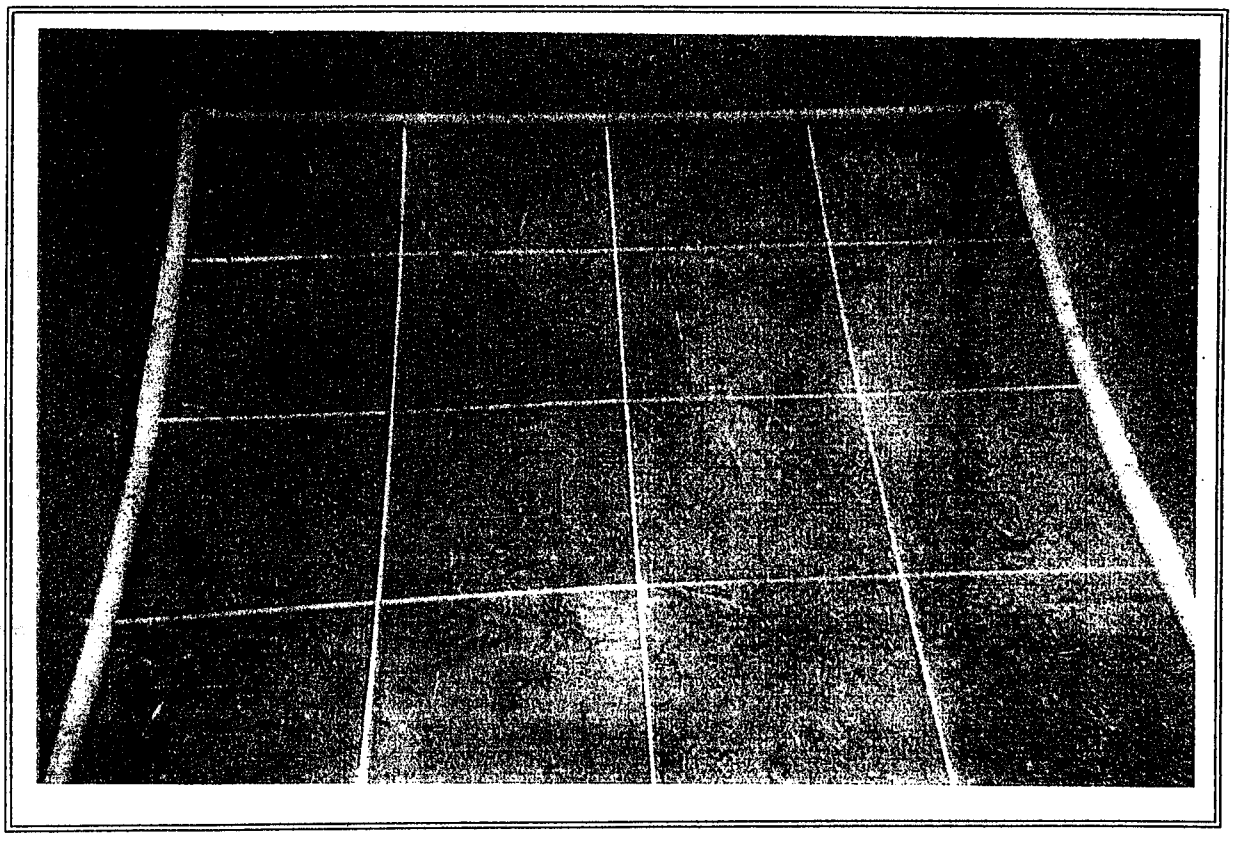
Transect No.:	2
Quadrat:	2
Channel Markers:	7 and 8

Water Depth (Feet):	4.5
Photo Direction:	S

Species	Percent Cover
Halodule wrightii	25
Thalassia testudinum	
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	25

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	25	62	76	54
Total Stems/square meter:	869			

* Each quadrat was divided into 16 subquadrats



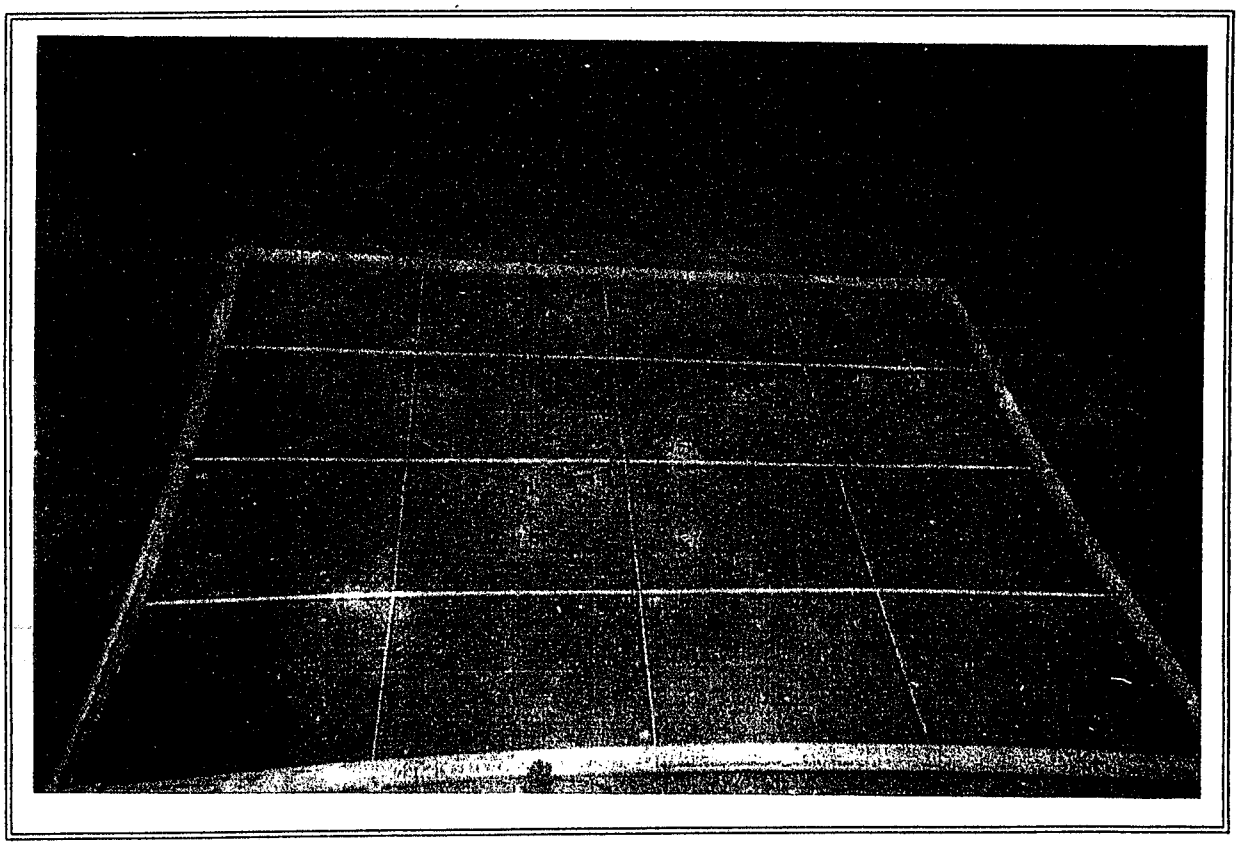
Transect No.:	2
Quadrat:	3
Channel Markers:	7 and 8

Water Depth (Feet):	4
Photo Direction:	W

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	1
Alga	
Bare ground	
Total Percent Cover (Vegetation)	2

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	0	4	0	1
Total Stems/square meter:	21			

* Each quadrat was divided into 16 subquadrats



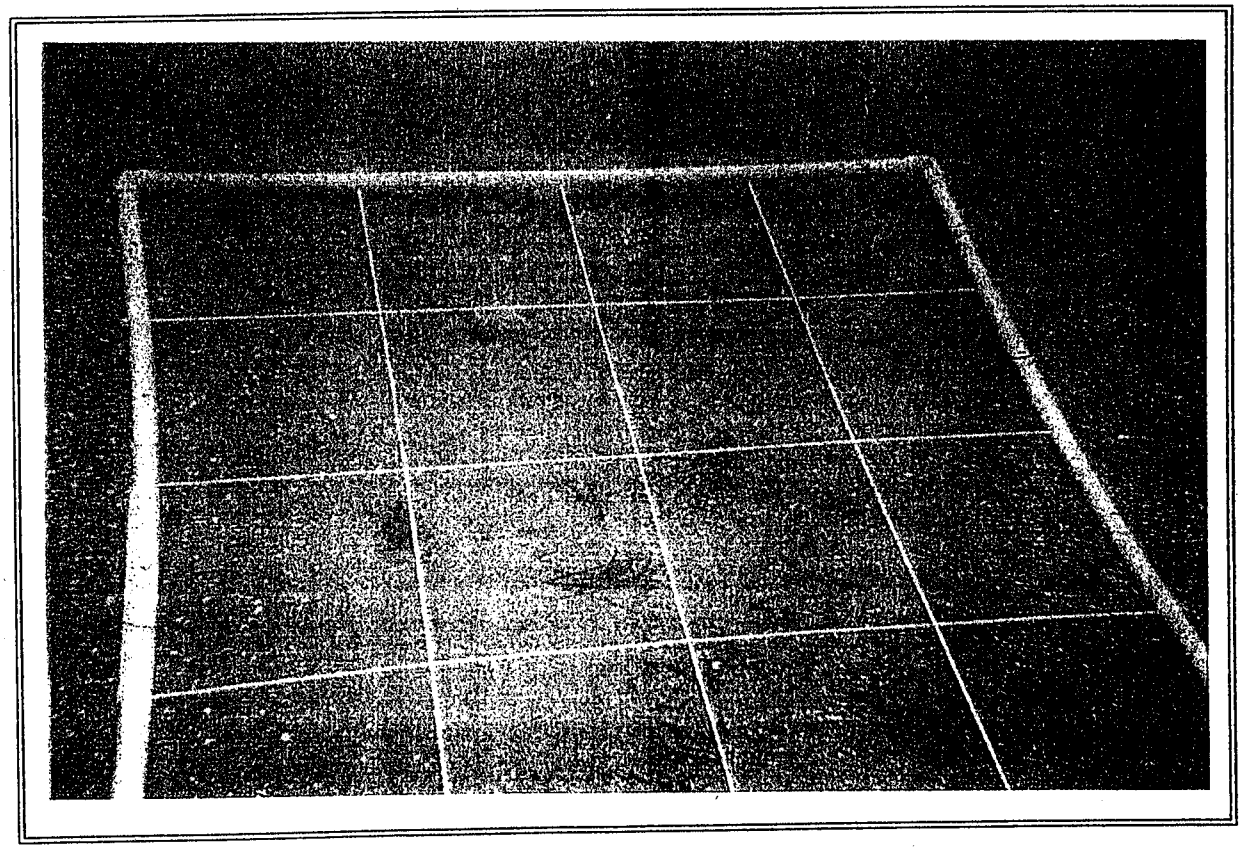
Transect No.:	3
Quadrat:	1
Channel Markers:	9 and 10

Water Depth (Feet):	4.5
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	1
Alga	
Bare ground	
Total Percent Cover (Vegetation)	2

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	10	2	4	5
Total Stems/square meter:	85			

* Each quadrat was divided into 16 subquadrats



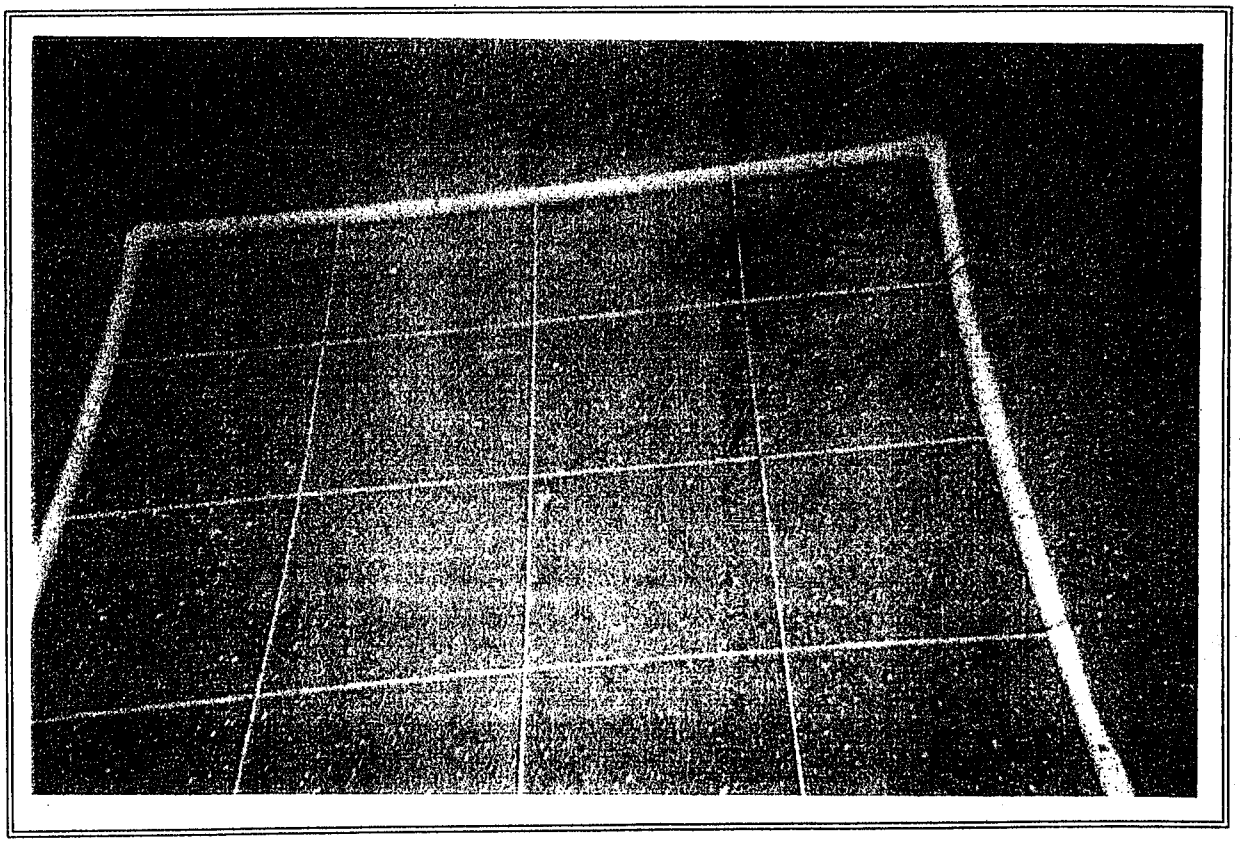
Transect No.:	3
Quadrat:	2
Channel Markers:	9 and 10

Water Depth (Feet):	4.5
Photo Direction:	S

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	1

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	8	2	14	8
Total Stems/square meter:	128			

* Each quadrat was divided into 16 subquadrats



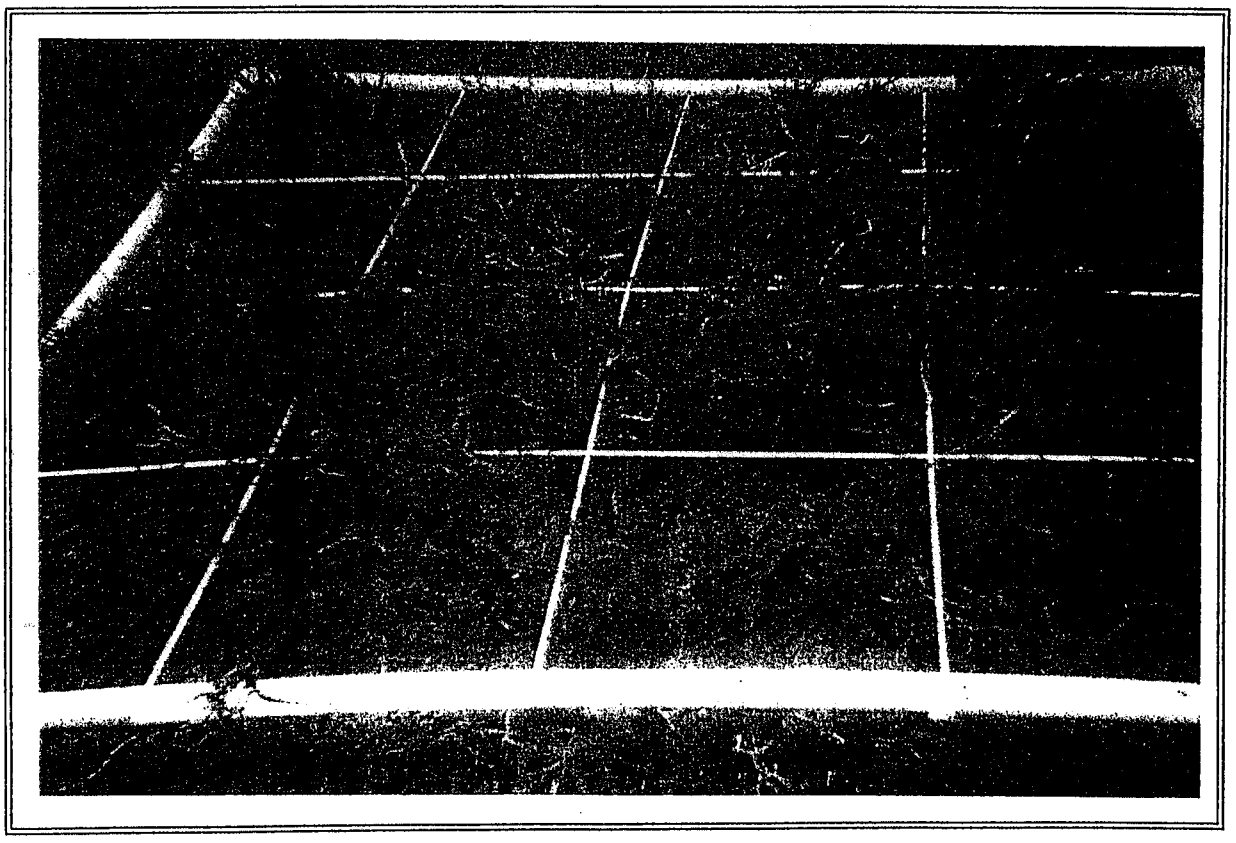
Transect No.:	3
Quadrat:	3
Channel Markers:	9 and 10

Water Depth (Feet):	3
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	40
Alga	100
Bare ground	
Total Percent Cover (Vegetation)	40

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	12	5	18	12
Total Stems/square meter:	187			

* Each quadrat was divided into 16 subquadrats



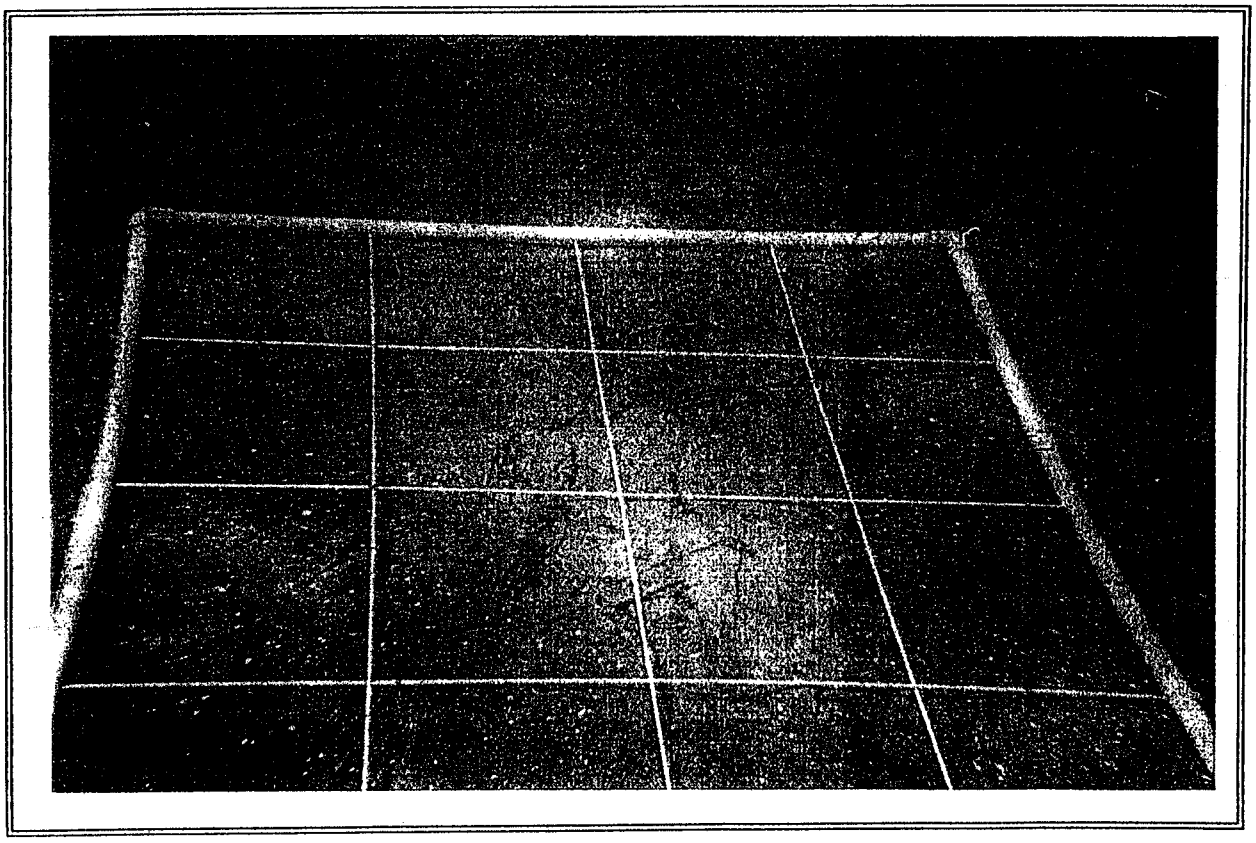
Transect No.:	4
Quadrat:	1
Channel Markers:	11 and 12

Water Depth (Feet):	4.5
Photo Direction:	W

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	1

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	4	13	19	12
Total Stems/square meter:	192			

* Each quadrat was divided into 16 subquadrats



Transect No.:	4
Quadrat:	2
Channel Markers:	11 and 12

Water Depth (Feet):	
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	1
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	2

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	20	17	3	13
Total Stems/square meter:	213			

* Each quadrat was divided into 16 subquadrats

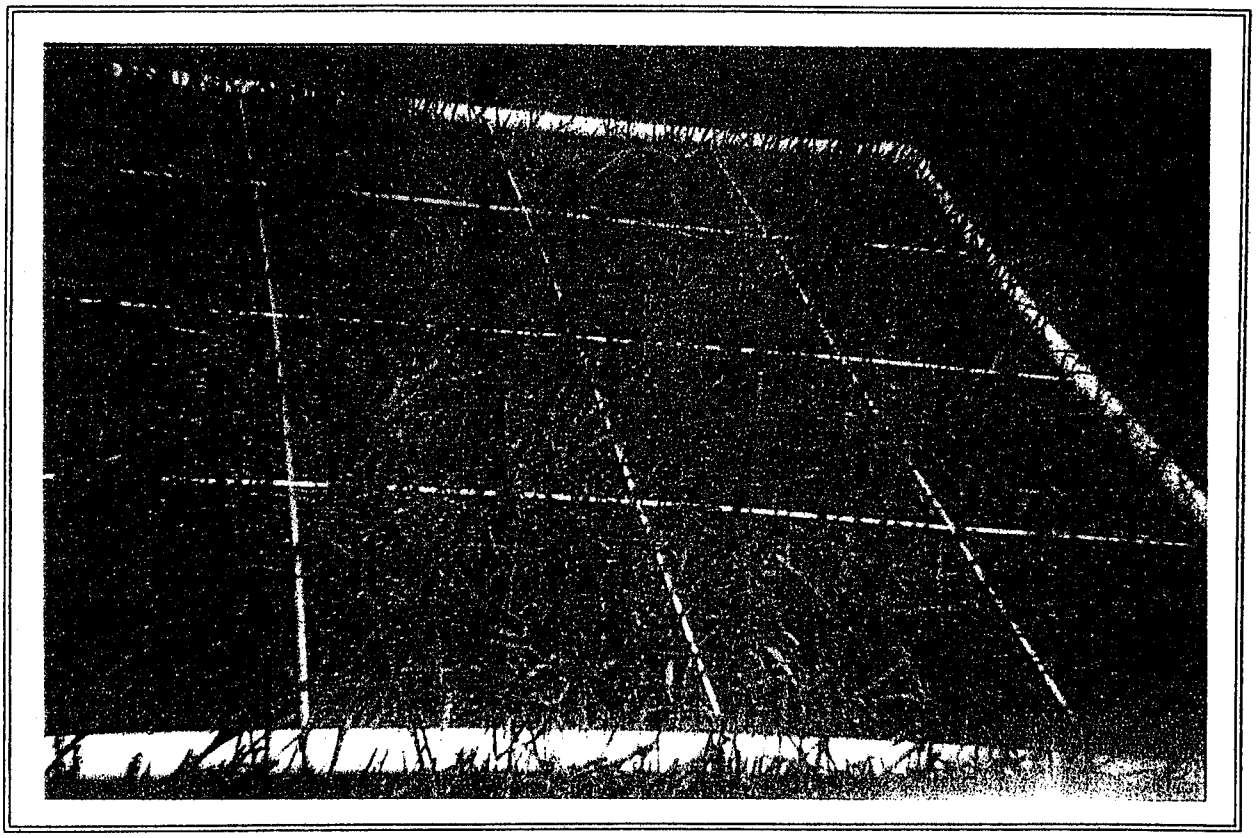
Transect No.:	4
Quadrat:	3
Channel Markers:	11 and 12

Water Depth (Feet):	2.5
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	100
Alga	
Bare ground	
Total Percent Cover (Vegetation)	100

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	49	38	38	42
Total Stems/square meter:	667			

* Each quadrat was divided into 16 subquadrats



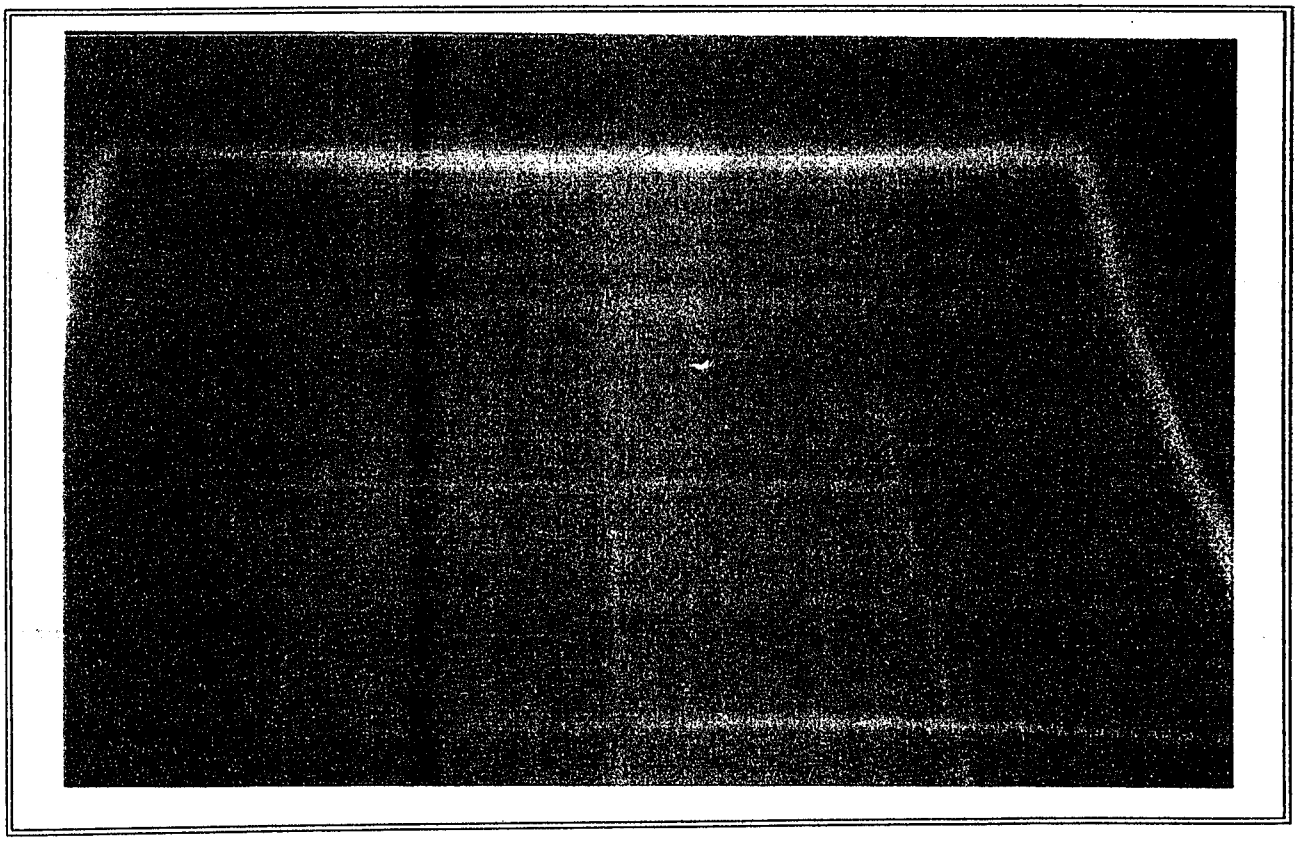
Transect No.:	5
Quadrat:	1
Channel Markers:	15a and 16a

Water Depth (Feet):	4
Photo Direction:	

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	1
Alga	
Bare ground	
Total Percent Cover (Vegetation)	2

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	14	6	0	7
Total Stems/square meter:	107			

* Each quadrat was divided into 16 subquadrats



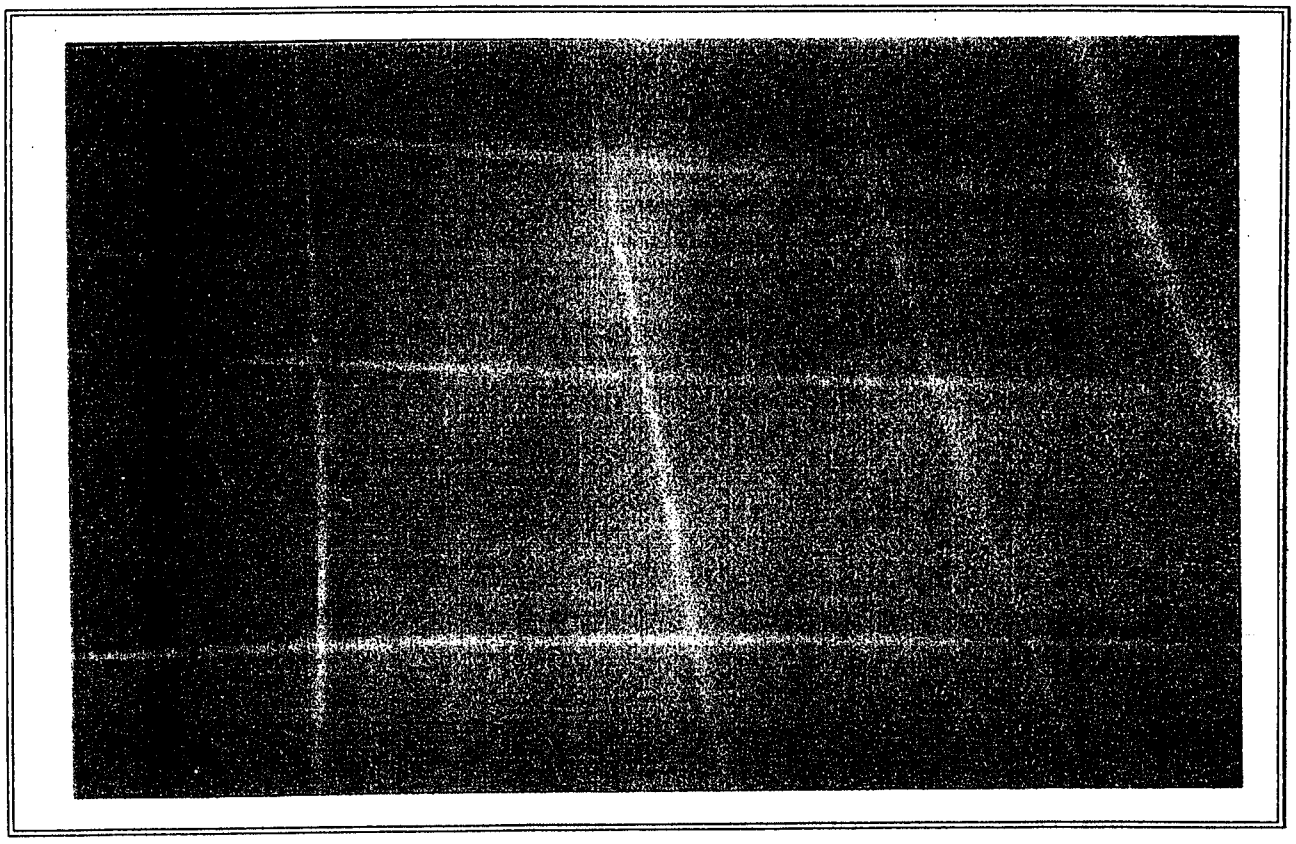
Transect No.:	5
Quadrat:	2
Channel Markers:	15a and 16a

Water Depth (Feet):	4
Photo Direction:	

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	
Alga	
Bare ground	
Total Percent Cover (Vegetation)	1

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	0	0	0	0
Total Stems/square meter:	0			

* Each quadrat was divided into 16 subquadrats



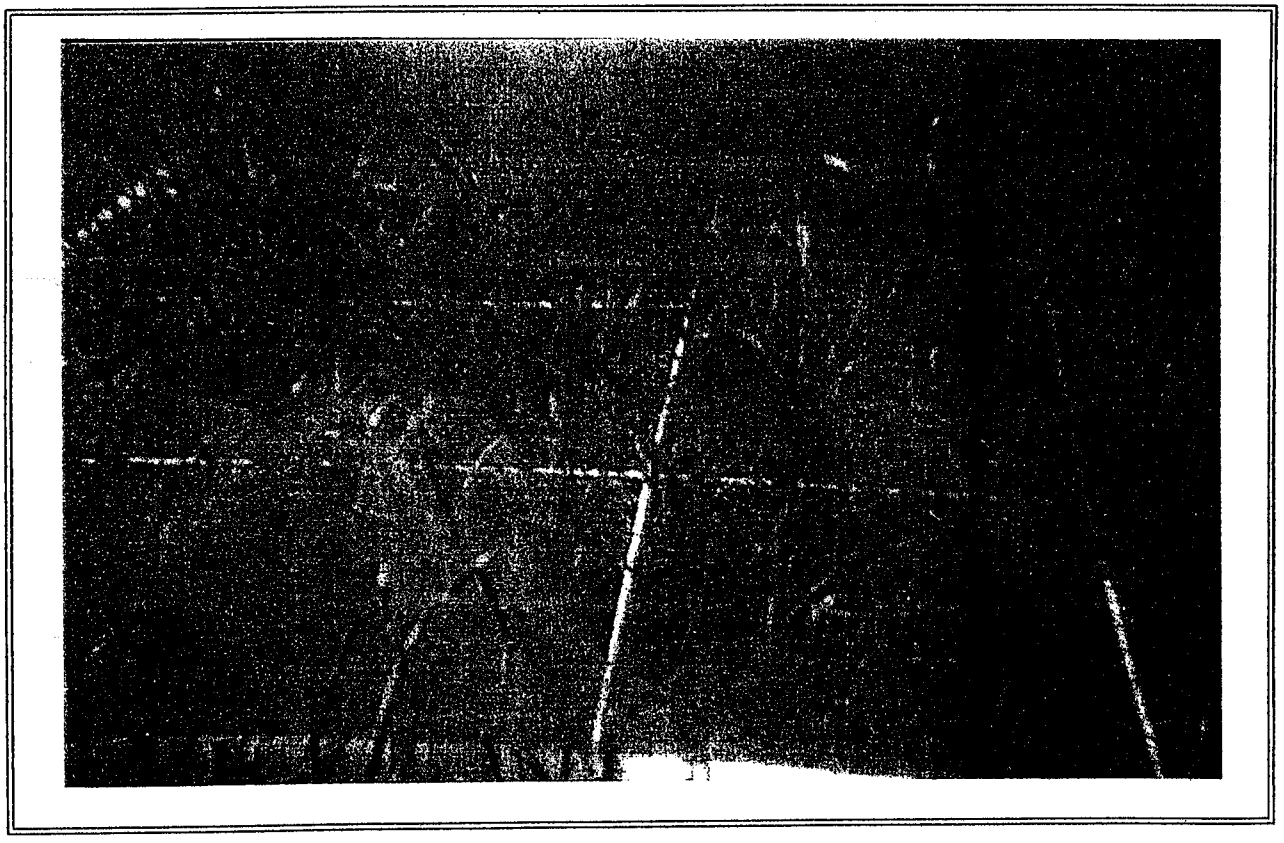
Transect No.:	5
Quadrat:	3
Channel Markers:	15a and 16a

Water Depth (Feet):	2.5
Photo Direction:	

Species	Percent Cover
Halodule wrightii	
Thalassia testudinum	99
Alga	1
Bare ground	
Total Percent Cover (Vegetation)	99

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	30	27	28	28
Total Stems/square meter:	453			

* Each quadrat was divided into 16 subquadrats



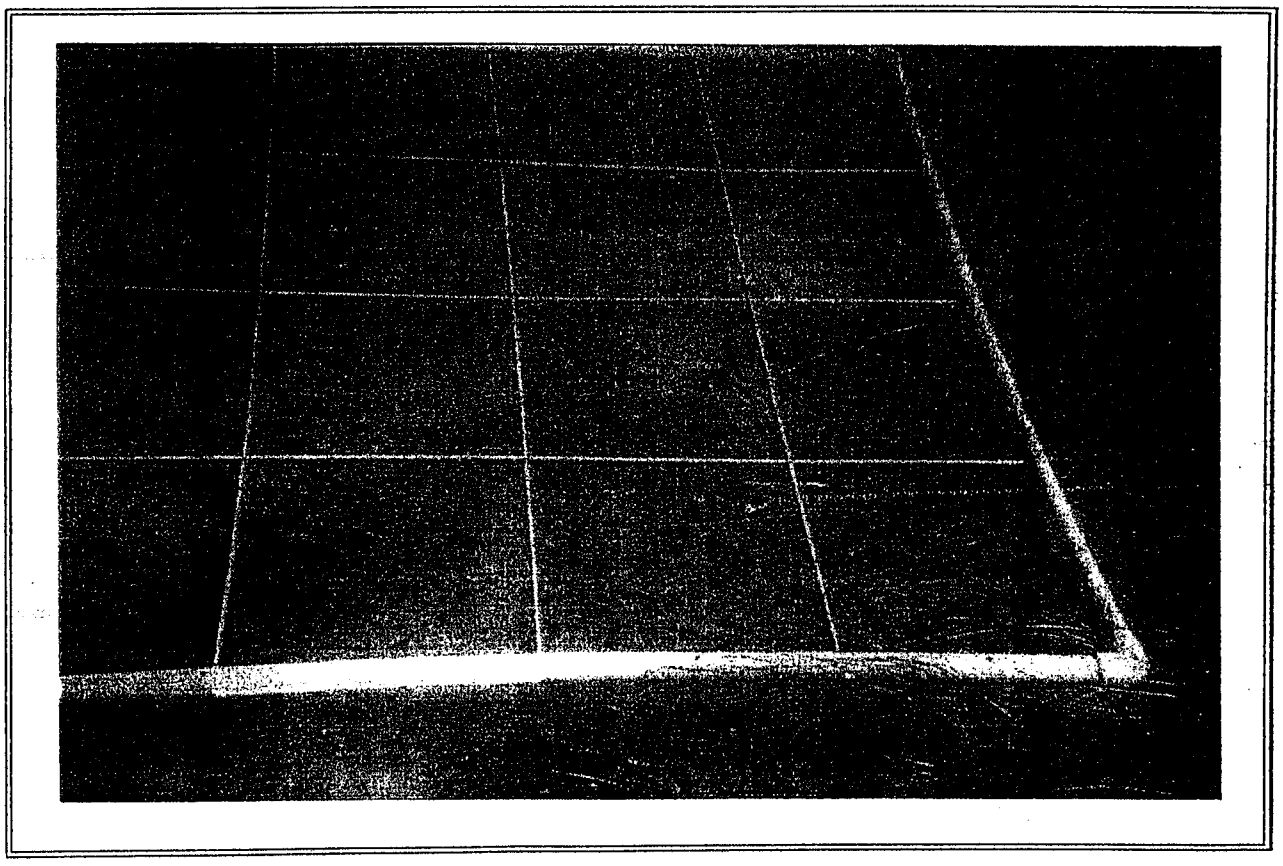
Transect No.:	6
Quadrat:	1
Channel Markers:	21 and 22

Water Depth (Feet):	4
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	
Alga	
Bare ground	
Total Percent Cover (Vegetation)	1

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	12	13	20	15
Total Stems/square meter:	240			

* Each quadrat was divided into 16 subquadrats



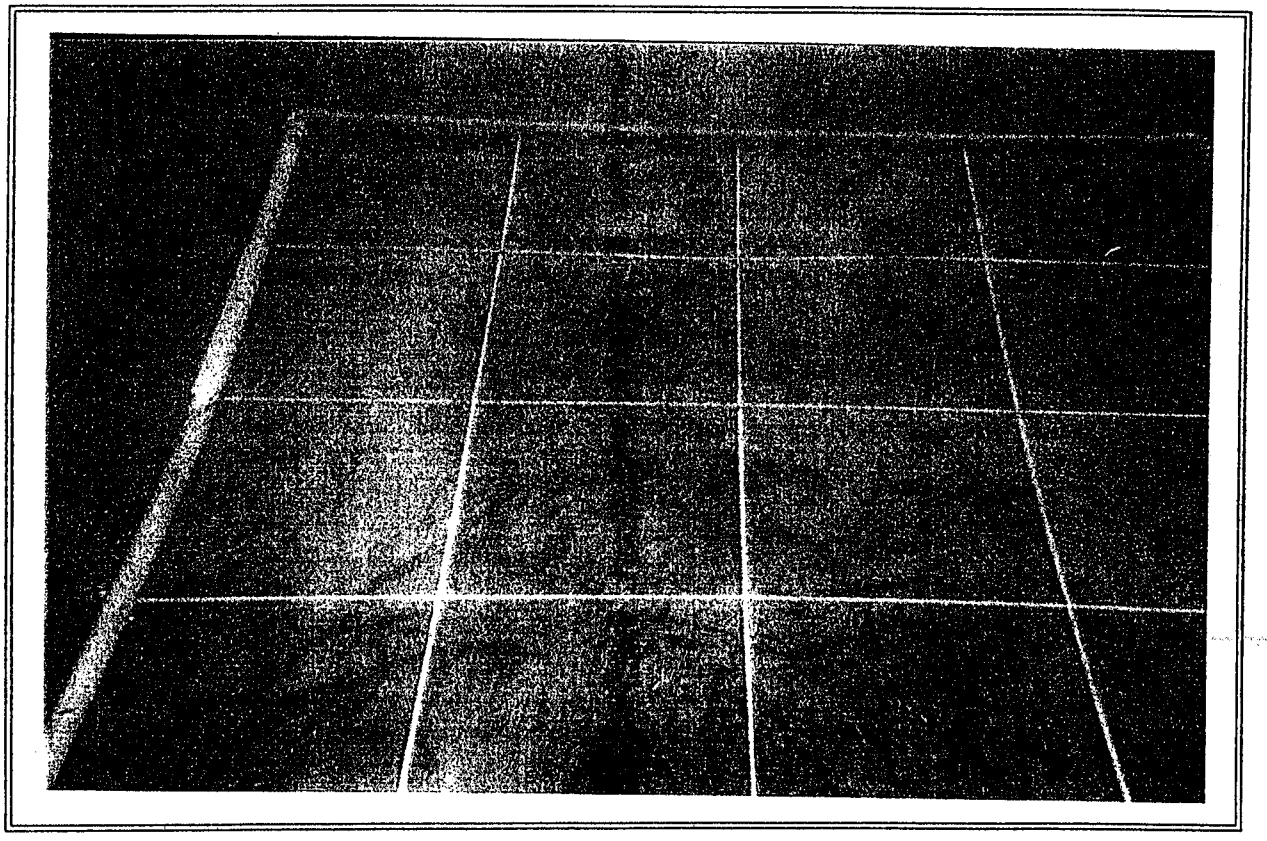
Transect No.:	6
Quadrat:	2
Channel Markers:	21 and 22

Water Depth (Feet):	4
Photo Direction:	

Species	Percent Cover
Halodule wrightii	1
Thalassia testudinum	
Alga	
Bare ground	
Total Percent Cover (Vegetation)	1

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	0	0	0	0
Total Stems/square meter:	0			

* Each quadrat was divided into 16 subquadrats



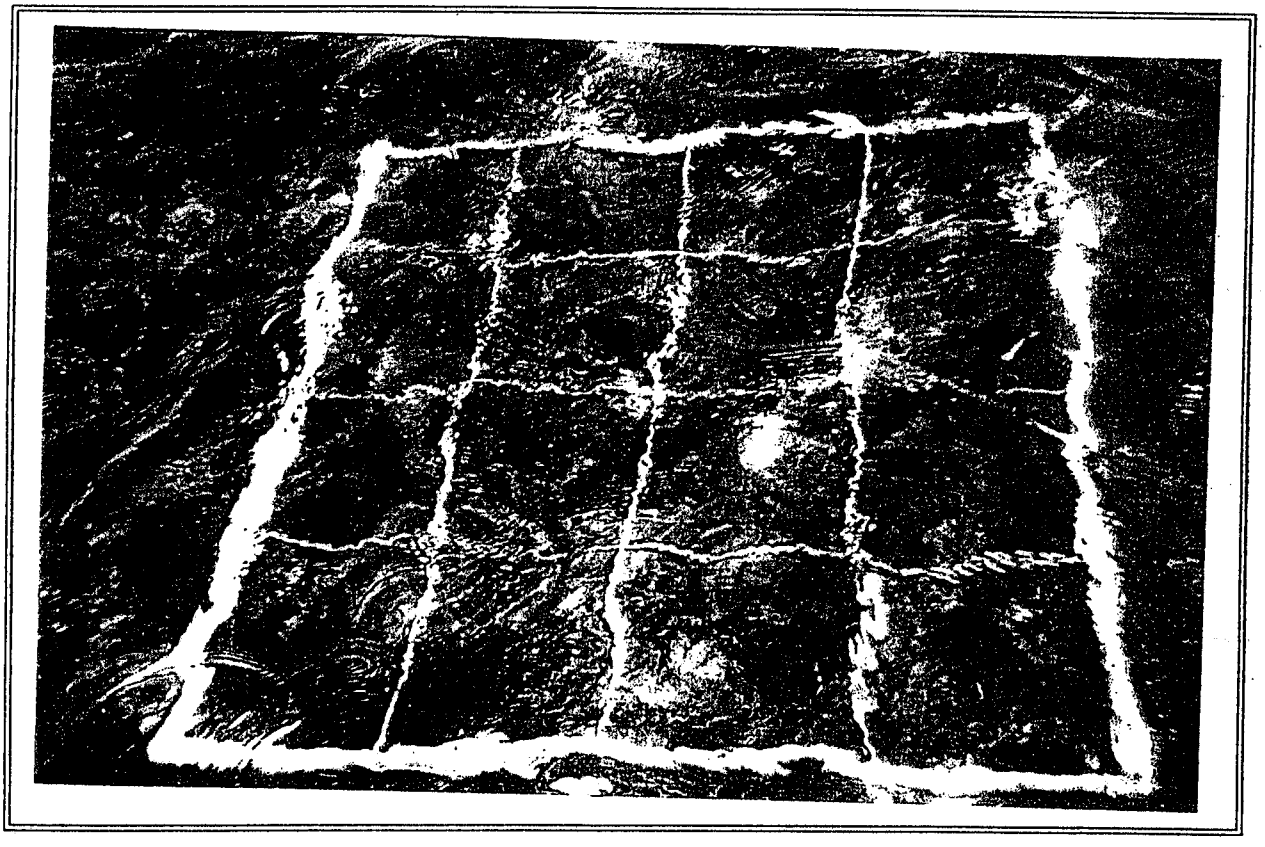
Transect No.:	6
Quadrat:	3
Channel Markers:	21 and 22

Water Depth (Feet):	1.5
Photo Direction:	N

Species	Percent Cover
Halodule wrightii	5
Thalassia testudinum	
Alga	
Bare ground	
Total Percent Cover (Vegetation)	5

*Subquadrat Quadrat No.	S4	S6	S13	ave
Shoot Density	13	16	47	25
Total Stems/square meter:	405			

* Each quadrat was divided into 16 subquadrats



Appendix B. List of Florida Seagrasses

Florida Oceanographic Society

Seagrasses of Florida

Seven (7) Species of Seagrass in Florida

Turtle Grass	*Thalassia testudinum*
Manatee Grass	*Syringodium filiforme*
Shoal Grass	*Halodule wrightii*
Paddle Grass	*Halophila decipiens*
Star Grass	*Halophila engelmannii*
Johnson's Seagrass	*Halophila johnsonnii*
Widgeon Grass	*Ruppia maritima*

Key to Florida's Seagrasses

Vegetative Key

Plants with flat leaf blades	 1
Plants with round or cylindrical leaf blades	..... *Syringodium filiforme*
1a. Leaves paddle shaped, each associated with 2 scales at the base	..... 2 *Halophila* species
1b. Leaves in pseudowhorl, each with 2 scales at the base and two scales halfway up the petiole or leaf stem	..... 3 *Halophila engelmannii*
1c. Leaves strap-like or at least linear	 4
2. Leaves with a rounded, oval in shape, leaf margins with minute serrations	..... *Halophila decipiens*
2. Leaves with a pointed tip, elogated, entire	..... *Halophila Johnsonii*
4. Leaf blades greater than 3 mm in width, generally about 1 cm wide, plant rhizomotous	..... *Thalassia testudinum*
4. Leaf blades generally less than 3 mm in width	 5
5. Leaves clustered from a distinct node on a rhizome, leaf tip is truncated	..... *Halodule wrightii*
5. Leaves, threadlike from a branched stem, leaf tip is pointed	..... *Ruppia maritima*

Back to Seagrass
Back to Our Local Environment

890 NE Ocean Boulevard, Stuart, Florida 34996 (561) 225-0505
URL: http://www.fosusa.org/environ/seagrass2.htm